UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/630,967	07/31/2003	Shigeki Ohta	16601-026001	1847

26181 7590 06/06/2007
FISH & RICHARDSON P.C.
PO BOX 1022
MINNEAPOLIS, MN 55440-1022

EXAMINER	
GAMETT, DANIEL C	
ART UNIT	PAPER NUMBER
1647	

MAIL DATE	DELIVERY MODE
06/06/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/630,967	OHTA ET AL.	
	Examiner	Art Unit	
	Daniel C. Gamett, PhD	1647	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 November 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2-13,15,16,22-36,39-44 and 50-56* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2-13,15,16,22-36, 39-44 and 50-56* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Upon further consideration, the Notice of Allowability mailed 03/26/2007 is hereby withdrawn.

2. Claims 2-13,15,16,22-36, 39-44 and 50-56, as amended by Examiner's amendment, mailed 11/28/2006, are under examination.

Priority

3. Applicant's claim for the benefit of a prior-filed application under 35 U.S.C. 119(e) or under 35 U.S.C. 120, 121, or 365(c) is acknowledged. Applicant has not complied with one or more conditions for receiving the benefit of an earlier filing date under 35 U.S.C. 119(e) as follows: The later-filed application must be an application for a patent for an invention which is also disclosed in the prior application (the parent or original nonprovisional application or provisional application). The disclosure of the invention in the parent application and in the later-filed application must be sufficient to comply with the requirements of the first paragraph of 35 U.S.C. 112. See *Transco Products, Inc. v. Performance Contracting, Inc.*, 38 F.3d 551, 32 USPQ2d 1077 (Fed. Cir. 1994).

4. The disclosure of the prior-filed application, Application No. 60399390, fails to provide adequate support or enablement in the manner provided by the first paragraph of 35 U.S.C. 112 for one or more claims of this application. Provisional Application No. 60399390 does not disclose any method comprising the administration of PACAP together with prolactin. The term 'prolactin' does not appear in Provisional Application No. 60399390.

5. Accordingly, the subject matter defined in claims 2-13,15,16,22-36, 39-44 and 50-56 has an effective filing date of 07/31/2003, the earliest date on which this disclosure was filed.

6. Should the applicant disagree with the examiner's factual determination above, it is incumbent upon the applicant to provide the serial number and specific page number(s) of any parent application filed prior to 07/31/2003 which specifically supports the particular claim limitation for each and every claim limitation in all the pending claims which applicant considers to have been in possession of and fully enabled for prior to 07/31/2003.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 2-13,15,16,22-33, 35, 36, 39-44 and 50-56 are rejected under 35 U.S.C. 102(e) as being anticipated by US Patent 7048934.

9. The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

10. All claims are drawn to methods wherein neural stem cells are contacted with pituitary adenylate cyclase-activating polypeptide (PACAP) and prolactin. Claims 27-36 recite in vitro

methods, Claim 22-26 and 2-4 read upon both in vitro and in vivo methods. Claims 5-13, 39-44 and 50-56 recite in vivo administration. The intended outcomes of the methods are variously recited as increasing neural stem cell and/or neural stem cell progeny number (claim 22), increasing the number of neural stem cells and/or neurospheres in a culture (claim 27), and enhancing differentiation of neural stem cells in a subject (claim 50).

11. The '934 patent teaches a method for producing neuronal precursor cells or glial precursor cells, comprising two steps in which neural stem cells are contacted with a factor; first to proliferate neural stem cells and then to enhance neuronal or glial formation from neural stem cells (step (b) and (c) in the paragraph bridging columns 3-4). The '934 patent teaches that both prolactin and PACAP are factors that can be used in each step, i.e. to stimulate proliferation of neural stem cells and to enhance neuronal or glial formation from neural stem cells (column 5, lines 14-20; column 9, lines 18-30). This method is taught to be usable in vivo or in vitro (column 9, line 31). The claims of the '934 patent are drawn to the administration to a mammal of a combination of EPO with prolactin, but the specification teaches that PACAP may be used in place of EPO (column 5, line 20). The combination of prolactin and PACAP is taught to be a preferred combination (column 10, line 63). These teachings explicitly anticipate independent claims 22, 27, and 50 of the instant application and inherently anticipate the intended outcomes recited in instant claims 2-4 and 39. These teachings anticipate the various orders of administration recited in instant claims 51-53, because both factors are taught to be usable alone or in combination for either step of the method.

12. The limitations in the dependent claims in the instant case are recited in the claims of the '934 patent or taught in the specification as follows. For in vivo treatment, the subject of the method is recited to be an adult mammal suspected of having a neurodegenerative disease or condition; the same conditions are recited in both cases (see claims 19-22 in the '934 patent and instant claims 5,7-12, 53-56). EGF and FGF-2 (recited in instant claims 33 and 35) are taught to be usable in the disclosed method to increase the number of neural stem cells at column 9, lines 23-24. The '934 patent teaches, at column 7, lines 1-37, each of the forms of PACAP and EGF recited in the instant claims 15, 16, 30-33, 35, 36, 40, and 41. The location of neural stem cells in the subventricular zone of the brain (instant claims 13 and 56) is recited in claims 6 and 17 of the '934 patent. Parenteral administration (as in instant claim 6) is taught in '934 at column 12, lines 51-65).

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

14. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 7048934, as applied to claim 33 above, and further in view of Whittemore *et al.*, Exp Cell Res. 1999 Oct 10;252(1):75-95 (of record) and Schlessinger *et al.*, Molecular Cell. 2000 Sep;6(3):743-

50 (of record). As noted above, US Patent 7048934 teaches use of PACAP and prolactin together with FGF-2, thus anticipating claim 33. US Patent 7048934 does not, however, teach heparan sulfate as recited in instant claim 34. Schlessinger et al., citing earlier work, teach that sulfated proteoglycans, such as heparan sulfate, interact with FGF-2 and FGF-2 receptors to facilitate receptor activation (see Introduction, second full paragraph); they specifically teach the crystal structure of the complex. It is a common practice in the art to include heparin in protocols where FGF-2 is used, as exemplified by Whittemore *et al.*, (see table 3). It would have been obvious to one of skill in the art at the time of the invention to use heparin sulfate along with FGF-2, with the motivation of ensuring that a required co-factor for receptor activation is not limiting.

Conclusion

15. No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel C Gamett, Ph.D., whose telephone number is 571 272 1853. The examiner can normally be reached on M-F, 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brenda Brumback can be reached on 571 272 0961. The fax phone number for the organization where this application or proceeding is assigned is 571 273 8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DCG
Art Unit 1647
29 May 2007

JANET L. ANDRES
SUPERVISORY PATENT EXAMINER